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(54) Title: VACCINE COMPOSITIONS COMPRISING L2 AND/OR L3 IMMUNOTYPE LIPOOLIGOSACCHARIDES FROM LGTB- NEISSERIA MINIGITIDIS

(57) Abstract: The present invention relates to the field of neisserial vaccine compositions, their manufacture, and the use of such compositions in medicine. More particularly it relates to processes of making novel engineered meningococcal strains which are more suitable for the production of neisserial, in particular meningococcal, outer-membrane vesicle (or bleb) vaccines. Advantageous processes and vaccine products are also described based on the use of novel LOS subunit or meningococcal outer-membrane vesicle (or bleb) vaccines which have been rendered safer and/or more effective for use in human subjects. In particular combinations of gene downregulations are described such as PorA & OpA, PorA and OpC, OpA and OpC, and PorA and OpA and OpC. Alternatively, or in addition, lgtB$^-$ is shown to be an optimal mutation for effectively and safely using L3 and/or L2 LOS in Neisseria vaccine compositions. Bleb vaccines derived from lgtB$^-$ and capsular polysaccharide deficient meningococcal mutants are further described; as are advantageous methods of making bleb preparations where LOS is to be retained as an important antigen.